



Technology *and* Social Inclusion

Rethinking the Digital Divide

Mark Warschauer

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The MIT Press
Cambridge, Massachusetts
London, England

First MIT Press paperback edition, 2004
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This book was set in Sabon by SNP Best-set Typesetter Ltd., Hong Kong
Printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Warschauer, Mark.

Technology and social inclusion : rethinking the digital divide /
Mark Warschauer.

p. cm.

Includes bibliographical references and index.

ISBN 0-262-23224-3 (hc. : alk. paper), 0-262-73173-8 (pb.)

1. Digital divide. 2. Marginality, Social. I. Title.

HN49.I56 W37 2003

303.48'33—dc21

2002075130

10 9 8 7 6 5 4 3 2

For Keiko

Contents

Acknowledgments ix

Introduction 1

**1 Economy, Society, and Technology: Analyzing the Shifting
Terrains 11**

2 Models of Access: Devices, Conduits, and Literacy 31

3 Physical Resources: Computers and Connectivity 49

4 Digital Resources: Content and Language 81

5 Human Resources: Literacy and Education 109

6 Social Resources: Communities and Institutions 153

7 Conclusion: The Social Embeddedness of Technology 199

Notes 217

References 225

Index 247

Acknowledgments

This book has been nearly ten years in the making, and its completion would not have been possible without the great deal of institutional and personal support I received over those years.

Most of the actual writing took place in 2001, while I worked as an assistant professor in the Department of Education at the University of California, Irvine. The department has been quite generous in allowing me to devote time and resources to this book, and I would especially like to thank the chair of the department, Rudy Torres; the former chair, Louis Mirón; and the former acting chair, Robert Beck, for their full support. Other colleagues in the department have also been extremely helpful, including Hank Becker, Joan Bissell, and Ann De Vaney.

I am also affiliated with the UC Irvine Center for Research on Information Technology and Organizations (CRITO), and my participation in CRITO seminars has been very helpful to the development of my ideas. I would like to thank CRITO and its former acting director, James Danziger, for involving me in the center and its seminars.

During the summer of 2001, I took research trips to China, India, and Brazil. I would like to thank all the individuals who took time to meet with me, and especially to thank the following people who helped with my arrangements and provided invaluable advice and assistance: Dr. Chen Hong of Beijing Capital Normal University in China; Chetan Sharma of Datamation in New Delhi; Naveen Prakash of Gyandoot Samiti in Dhar, India; Senthil Kumaran of M. S. Swaminathan Foundation in Madras, India; Aditya Dev Sood of the Center for Knowledge Societies in Bangalore, India; Vera Mello of the University of São Paulo, Brazil; and Solange Gervai of Yázigi Internexus in São Paulo.

During 2001–2002, I had four grants from the University of California to examine the availability of, access to, and use of information and communication technologies in low-income neighborhood schools. This book has benefited from that research, and I would like to acknowledge the support of UC Nexus, directed by Charles Underwood of the University of California's President's Office; the University of California All Campus Consortium on Research on Diversity, directed by Jeannie Oakes and Danny Solorzano; and the University of California, Irvine, Center for Educational Partnerships, directed by Juan Lara. I would also like to acknowledge and thank LeeAnn Stone, Michele Knobel, Melanie Wade, Fang Xu, and Jodie Wales for their collaboration on that research.

In 2001, I also visited several Community Technology Centers in California. Linda Fowells and Richard Chabran of Community Partners provided extremely helpful support and information for this aspect of my research.

From 1998 to 2001, I worked for the America-Mideast Educational and Training Services, Inc. (AMIDEAST) on a project in Egypt called IELP-II, funded by the U.S. Agency for International Development (USAID). My work and research in Egypt was central to many of the ideas expressed in this book, and I would like to thank AMIDEAST, USAID, and IELP-II for the opportunity to carry out that work. I would especially like to thank Doug Duncan of AMIDEAST Washington, Jennifer Notkin of USAID Egypt, and Randa Effat of IELP-II. Ghada Refaat and Ayman Zohry of IELP-II assisted me in carrying out a research study of online language use in Egypt, and Russanne Hozayin of IELP-II also was generous with her information and assistance. I would also like to thank a number of other Egyptian and American colleagues in Egypt who collaborated with me and otherwise provided information and support, including Richard Boyum of the U.S. Embassy; Inas Barsoum of Ain Shams University; Kamal Fouly of Minia University; Maha El Said and Mounira Soliman of Cairo University; and Paul Stevens, Gini Stevens, and Kate Coffield of the American University in Cairo.

From 1994 to 1998, I taught and conducted research at the University of Hawai'i for the Department of Second Language Studies, the

National Foreign Language Resource Center (NFLRC), and the College of Languages, Linguistics, and Literature. Again, much of that research has influenced, and found its way into, this book, and I would like to thank Roderick Jacobs, dean of the College; Richard Schmidt, director of the NFLRC; and Gabrielle Kasper, Graham Crookes, and Kathryn Davis of the Department of Second Language Studies for their support. Lois Yamauchi of the University of Hawai'i Educational Psychology Department and Jim Cummins of the University of Toronto also provided valuable support for my research in Hawai'i. I received a great deal of assistance from colleagues in the Hawaiian educational community for my research, especially from Keola Donaghy of Hale Kuamo'o at the University of Hawai'i, Hilo, and Makalapua Ka'awa of the University of Hawai'i, Manoa.

A number of colleagues provided assistance, support, and ideas by co-authoring pieces that formed the basis of this book, critiquing this or related manuscripts, or otherwise sharing ideas. Rick Kern, Hank Becker, Phil Agre, Dafney Dabach, Eszter Hargittai, Fang Xu, and Martha Forero offered extremely helpful comments on the manuscript. Their contribution has been enormous, and I cannot thank them enough. I would also like to recognize and thank Dorothy Chun of the University of California, Santa Barbara; Mike Cole, Olga Vasquez, Bud Mehan, and Leigh Starr of the University of California, San Diego; Irene Thompson and Pam DaGrossa of *Language Learning and Technology* journal; Peiya Gu of Suzhou University in China; and Heidi Helfand of Expert City for their collaboration and support in a variety of projects and discussions that helped give intellectual birth to this book. And I am indebted to Cathy Appel for her invaluable assistance with the manuscript preparation.

The editors and reviewers at MIT Press have been extremely helpful, and I would especially like to thank acquisition editor Katherine Innis. MIT Press has shown great leadership in areas related to the social, economic, political, and cultural ramifications of new technology use, and the editors and associates at the Press have been remarkably helpful in ushering this book from original proposal to publication.

My deepest thanks are to my wife, Keiko Hirata. Keiko has read and provided extremely helpful comments on almost everything I have

written, and her own research on civil society in East Asia and the Middle East has played a formative role in my work. I could not have written this book without her, nor would such an endeavor have been worthwhile without her love and support.

Technology and Social Inclusion

Introduction

The purpose of this book is to examine the relationship between information and communication technology (ICT) and social inclusion. A starting point for my research has been the concept of a digital divide, used by the U.S. National Telecommunications and Information Administration under the Clinton administration to refer to the gap between those who do and do not have access to computers and the Internet. However, during the process of my research, the notion of a digital divide and its logical implication—that social problems can be addressed through providing computers and Internet accounts—have seemed increasingly problematic. Three vignettes will help illustrate this point.

A Slum “Hole-in-the-Wall”

In 2000 the government of New Delhi, in collaboration with an information technology corporation, established a project, known as the Hole-in-the-Wall experiment, to provide computer access to the city’s street children.¹ An outdoor five-station computer kiosk was set up in one of the poorest slums of New Delhi. Though the computers themselves were inside a booth, the monitors protruded through holes in the walls, as did specially designed joysticks and buttons that substituted for the computer mouse. Keyboards were not provided. The computers were connected to the Internet through dial-up access. A volunteer inside the booth helped keep the computers and Internet connections running.

No teachers or instructors were provided, in line with a concept called minimally invasive education. The idea was to allow the children

unfettered 24-hour access to learn at their own pace and speed rather than tie them to the directives of adult organizers or instructors.

According to reports, children who flocked to the site taught themselves basic computer operations. They worked out how to click and drag objects; select different menus; cut, copy, and paste; launch and use programs such as Microsoft Word and Paint; get on the Internet; and change the background “wallpaper.” The program was hailed by researchers (e.g., Mitra 1999) and government officials² as a groundbreaking project that offered a model for how to bring India’s and the world’s urban poor into the computer age.

However, visits to the computer kiosk indicated a somewhat different reality. The Internet access was of little use because it seldom functioned. No special educational programs had been made available, and no special content was provided in Hindi, the only language the children knew. Children did learn to manipulate the joysticks and buttons, but almost all their time was spent drawing with paint programs or playing computer games.

There was no organized involvement of any community organization in helping to run the kiosk because such involvement was neither solicited nor welcomed (see chapter 6). Indeed, the very architecture of the kiosk—based on a wall rather than in a room—made supervision, instruction, and collaboration difficult.

Parents in the neighborhood had ambivalent feelings about the kiosk. Some saw it as a welcome initiative, but most expressed concern that the lack of organized instruction took away from its value. Some parents even complained that the kiosk was harmful to their children. As one parent stated, “My son used to be doing very well in school, he used to concentrate on his homework, but now he spends all his free time playing computer games at the kiosk and his schoolwork is suffering.” In short, parents and the community came to realize that minimally invasive education was, in practice, minimally effective education.

An Information Age Town

In 1997, Ireland’s national telecommunications company held a national competition to select and fund an “Information Age Town.”³ A major

rationale behind the effort was to help overcome the gap between Ireland's emerging status as a multinational business center of ICT *production* and the rather limited *use* of ICT among Ireland's own people and indigenous small businesses.

Towns of 5,000 people and more across Ireland were invited to compete by submitting proposals detailing their vision of what an Information Age Town should be and how they could become one. The winning town was to receive 15 million Irish pounds (at that time roughly \$22 million U.S. dollars—USD) to implement its vision.

The sponsor of the competition, Telecom Eirann (later renamed Eircom), was getting ready to be privatized. The company naturally had an interest in selecting the boldest, most ambitious proposal so as to showcase the winning town as an innovative example of what advanced telecommunications could accomplish for the country under the company's leadership. Four towns were chosen as finalists, and then Ennis, a small, remote town of 15,000 people in western Ireland, was selected among them as the winner. The prize money that Ennis received represented over \$1,200 USD per resident, a huge sum for a struggling Irish town.

At the heart of Ennis's winning proposal was a plan to give an Internet-ready personal computer to every family in the town. Other initiatives included an ISDN line to every business, a Web site for every business that wanted one, smart-card readers for every business (for a cashless society), and smart cards for every family. Ennis was strongly encouraged by Telecom Eivann to implement these plans as quickly as possible.

Meanwhile, the three runners-up—the towns of Castlebar, Kilkenny, and Killarney—each received consolation prizes of 1 million Irish pounds (about \$1.5 million USD). These towns were given as much time as they needed to make use of the money.

How did the project turn out? A visit to Ennis three years later by a university researcher indicated that the town had little to show for its money. Advanced technology had been thrust into people's hands with little preparation. Training programs had been run, but they were not sufficiently accompanied by awareness programs as to why people should use the new technology in the first place. And, in some instances,

well-functioning social systems were disrupted in order to make way for the showcase technology.

For example, as is the case in the rest of Ireland, the unemployed of Ennis had been reporting to the social welfare office three times a week to sign in and receive payments. Following their visits, the people usually stayed around the office to chat with other unemployed workers. The sign-in system thus facilitated an important social function to overcome the isolation of the unemployed.

As part of the “Information Age Town” plan, though, the unemployed received computers and Internet connections at home. They were instructed to sign in and receive electronic payments via the Internet rather than come to the office to sign in. But many of the unemployed couldn’t figure out how to operate the equipment, and most others saw no reason to do so when it deprived them of an important opportunity for socializing. A good number of those computers were reportedly sold on the black market, and the unemployed simply returned of their own accord to coming to the social welfare office to sign in.

Meanwhile, what happened in the other three towns? With far fewer resources, they were forced to carefully plan how to make use of their funds rather than splurging for massive amounts of equipment. Community groups, small businesses, and labor unions were involved in the planning process. Much greater effort and money were spent on developing awareness, planning and implementing effective training, and setting up processes for sustainable change rather than merely on purchase of equipment. The towns built on already existing networks among workers, educators, and businesspeople to support grassroots uses of technology for social and economic development. Information about social services and job opportunities was put online. Small businesses and craft workers learned how to pool their resources to promote their products through e-commerce. Technology coordinators were appointed at schools and worked with other teachers to develop plans for better integration of ICT in classrooms. In the end, according to a researcher from University College Dublin,⁴ the three runners-up, which each received only one-fifteenth of the money that Ennis received, actually had more to show for their efforts to promote social inclusion through technology than did the winner.

A Model Computer Lab

An international donor project funded by the U.S. Agency for International Development (USAID) decided to donate a computer laboratory to the college of education at a major Egyptian university. The purpose of the donation was to establish a model teacher training program in computer-assisted learning in one of the departments of the college. State-of-the-art equipment was selected, including more than forty Pentium III computers, an expensive video projection system, several printers and scanners, and tens of thousands of U.S. dollars worth of educational software. This was to be a model project that both the U.S. and Egyptian governments would view with pride. To guarantee that the project would be sustainable, the Egyptian university would be required to manage all the ongoing expenses and operations, including paying for Internet access, maintaining the local area network (LAN), and operating the computer laboratory.

Under a paid contract from USAID, a committee from the college of education put together a detailed proposal on how the laboratory would be used, run, and maintained. Based on this proposal, USAID purchased all the hardware and software. However, well before the equipment was installed, it became clear that the college would have difficulty absorbing such a huge and expensive donation. Other departments within the college, which together had access to only a handful of computers, became envious that a single department would have such modern and expensive equipment, and they attempted to block the university's support for the lab. The college of education and the university could not easily justify spending the money to house and maintain such an expensive laboratory for a single program when other programs were poorly funded. No money was available to hire an outside LAN manager or provide Internet access at the level agreed upon in the proposal. Faculty relations problems also arose, as a key department chair resented the involvement and initiative of less senior faculty members who were taking computer training and working together to plan new curricula. Because of all these difficulties, the expensive state-of-the-art computers sat in boxes in a locked room for more than a year before they were even installed, thus losing about one-third of their economic value.

Rethinking the Digital Divide

Each of the programs described in the preceding vignettes was motivated by a sincere attempt to improve people's lives through ICT. But each program ran into unexpected difficulties that hindered the results. Of course, any ICT project is complicated, and none can be expected to run smoothly. But the problems with these projects were neither isolated nor random. Rather, these same types of problems occur again and again in technology projects around the world, which too often focus on providing hardware and software and pay insufficient attention to the human and social systems that must also change for technology to make a difference. As seen in these three vignettes, meaningful access to ICT comprises far more than merely providing computers and Internet connections. Rather, access to ICT is embedded in a complex array of factors encompassing physical, digital, human, and social resources and relationships. Content and language, literacy and education, and community and institutional structures must all be taken into account if meaningful access to new technologies is to be provided.

Some would try, as I have tried in the past, to stretch the notion of a digital divide to encompass this broad array of factors and resources. In this sense, a digital divide is marked not only by physical access to computers and connectivity but also by access to the additional resources that allow people to use technology well. However, the original sense of *digital divide*, which attached overriding importance to the physical availability of computers and connectivity rather than to issues of content, language, education, literacy, or community and social resources, is difficult to overcome in people's minds.

A second problem with the digital divide concept is its implication of a bipolar societal split. As Cisler (2000) argues, there is not a binary division between information haves and have-nots, but rather a gradation based on different degrees of access to information technology. Compare, for example, a professor at UCLA with a high-speed connection in her office, a student in Seoul who occasionally uses a cyber café, and a rural activist in Indonesia who has no computer or phone line but whose colleagues in the nongovernmental organization (NGO) with whom she is working download and print out information for her. This example illus-

trates just three degrees of possible access a person can have to online material.

The notion of a binary divide between haves and have-nots is thus inaccurate and can even be patronizing because it fails to value the social resources that diverse groups bring to the table. For example, in the United States, African Americans are often portrayed as being on the wrong side of a digital divide (e.g., Walton 1999) when in fact Internet access among blacks and other minorities varies tremendously by income group—with divisions between blacks and whites decreasing as income increases (NTIA 2000). Some argue that the stereotype of disconnected minority groups could even serve to further social stratification by discouraging employers or content providers from reaching out to those groups. As Henry Jenkins, director of comparative media studies at the Massachusetts Institute of Technology, argues, “The rhetoric of the digital divide holds open this division between civilized tool-users and uncivilized nonusers. As well meaning as it is as a policy initiative, it can be marginalizing and patronizing in its own terms” (quoted in Young 2001, A51).

In addition, the notion of a digital divide—even in its broadest sense—implies a chain of causality: that lack of access (however defined) to computers and the Internet harms life chances. While this point is undoubtedly true, the reverse is equally true; those who are already marginalized will have fewer opportunities to access and use computers and the Internet. In fact, technology and society are intertwined and co-constitutive, and this complex interrelationship makes any assumption of causality problematic.

Finally, the digital divide framework provides a poor road map for using technology to promote social development because it over-emphasizes the importance of the physical presence of computers and connectivity to the exclusion of other factors that allow people to use ICT for meaningful ends. Rob Kling, director of the Center for Social Informatics at Indiana University, explains this shortcoming well:⁵

[The] big problem with “the digital divide” framing is that it tends to connote “digital solutions,” i.e., computers and telecommunications, without engaging the important set of complementary resources and complex interventions to support social inclusion, of which informational technology applications may be

enabling elements, but are certainly insufficient when simply added to the status quo mix of resources and relationships.

The bottom line is that there is no binary divide and no single overriding factor for determining such a divide. ICT does not exist as an external variable to be injected from the outside to bring about certain results. Rather, it is woven in a complex manner into social systems and processes. And, from a policy standpoint, the goal of using ICT with marginalized groups is not to overcome a digital divide but rather to further a process of social inclusion. To accomplish this, it is necessary to “focus on the transformation, not the technology” (Jarboe 2001, 31). For all these reasons, I join with others (e.g., DiMaggio and Hargittai 2001; Jarboe 2001) in recognizing the historical value of the digital divide concept (it helped focus attention on an important social issue) while preferring to embrace alternative concepts and terminology that more accurately portray the issues at stake and the social challenges ahead.

Social Inclusion

The alternative framework that I suggest in this book is the intersection of ICT and social inclusion. Social inclusion and exclusion are prominent concepts in European discourse.⁶ They refer to the extent that individuals, families, and communities are able to fully participate in society and control their own destinies, taking into account a variety of factors related to economic resources, employment, health, education, housing, recreation, culture, and civic engagement.

Social inclusion is a matter not only of an adequate share of resources but also of “participation in the determination of both individual and collective life chances” (Stewart 2000). It overlaps with the concept of socioeconomic equality but is not equivalent to it. There are many ways that the poor can have fuller participation and inclusion even if they lack an equal share of resources. At the same time, even the well-to-do may face problems of social exclusion because of political persecution or discrimination based on age, gender, sexual preference, or disability. The concept of social inclusion does not ignore the role of class but recognizes that a broad array of other variables help shape how class forces

interact. Though a historical treatment of the term is beyond the scope of this book, one could argue that the concept of social inclusion reflects particularly well the imperatives of the current information era, in which issues of identity, language, social participation, community, and civil society have come to the fore (Castells 1997).

This book takes as a central premise that the ability to access, adapt, and create new knowledge using new information and communication technology is critical to social inclusion in today's era (see chapter 1). I thus examine several questions related to this premise: How and why is access to ICT important for social inclusion? What does it mean to have access to ICT? How can access for social inclusion best be promoted in diverse circumstances? By focusing on technology for social inclusion, I thus hope to help reorient discussion of the digital divide from one that focuses on gaps to be overcome by provision of equipment to one that focuses on social development issues to be addressed through the effective integration of ICT into communities, institutions, and societies.

Sources of Data

This book draws largely on my own empirical research in a number of countries throughout the world. I have focused most of my research on countries such as India, Brazil, Egypt, China, and the United States that have extensive poverty; large gaps between rich and poor; substantial but unequally distributed ICT resources; and a myriad of local and national programs attempting to use technology to promote social inclusion.

My empirical research in these countries has included both long-term ethnographic research (e.g., in Hawai'i, 1995–1997 and Egypt, 1998–2001) and short-term, intensive field observations (e.g., in India, 2001; Brazil, 2001; China, 1999 and 2001; and California, 2001). During this widespread and differential research, I visited schools, universities, community technology centers, telecenters, NGOs, and government offices. I observed dozens of technology access and training programs. I interviewed a wide range of people, including government officials and policymakers, educators, representatives of community associations and NGOs, leaders of information technology companies,

and children and adults participating in community technology programs. Altogether, over a period of six years I interviewed more than 200 people and wrote up some 500 pages of observation field notes.

In addition, I bring to this extensive data set an analysis of secondary data published in a variety of print and online sources. These include newspaper and magazine articles, books, academic journals, governmental and nongovernmental reports, and online essays and discussions. Some of my most important ongoing sources have included periodicals such as the *New York Times*, the *Los Angeles Times*, and the *Economist*; online forums such as the Digital Divide discussion list, the Global Knowledge for Development discussion list, the Association for Internet Researchers discussion list, and Red Rucker Eater News;⁷ and reports from the World Bank, the United Nations Development Programme, and the National Telecommunications and Information Administration.

Organization

The first two chapters of this book provide a historical and theoretical framework to issues of technology and social inclusion. Chapter 1 provides the overall contextual background for the book by analyzing the transformation occurring in global economics, society, and technology. Chapter 2 looks back to other historical divides, such as those related to electrification, universal telephone service, and literacy, to analyze models of access to technology and media. This second chapter identifies four types of technology-associated resources that are essential to access and inclusion: physical, digital, human, and social. Subsequently, chapters 3 to 6 analyze these four resources in more depth. Chapter 3 examines physical resources: computers and connectivity. Chapter 4 examines digital resources: content and language. Chapter 5 examines human resources: literacy and education; and chapter 6 examines social resources: communities and institutions. Each of these chapters attempts to provide both a conceptual framework, drawing on relevant social theory, and empirical evidence and examples from both developing and developed countries. Finally, chapter 7 draws together the main arguments of the book by examining theories of the social embeddedness of technology.

References

- Abamedia. 1999. Propaganda in the propaganda state. <http://www.pbs.org/redfiles/prop/inv/prop_inv_ins.htm>. Retrieved May 10, 2001.
- Accenture, Markle Foundation, and United Nations Development Programme. 2001. Creating a development dynamic: Final report of the digital opportunity initiative. <<http://www.opt-init.org/framework.html>>. Retrieved January 1, 2002.
- Adelman, M. B., M. R. Parks, and T. L. Albrecht. 1987. Beyond close relationships: Support in weak ties. In *Communicating social support*, ed. T. L. Albrecht and M. B. Adelman, 126–147. Newbury Park, Calif.: Sage.
- Agre, P. E. 1997. Building community networks. In *Reinventing technology, rediscovering community: Critical explorations of computing as a social practice*, ed. P. E. Agre and D. Schuler, 241–248. Greenwich, Conn.: Ablex.
- . 1998. Building an Internet culture. *Telematics and Informatics* 15 (3): 231–234.
- . 1999a. Growing a democratic culture: John Commons on the wiring of civil society. Paper presented at the Media in Transition Conference, Massachusetts Institute of Technology, Cambridge, Mass. <<http://dliis.gseis.ucla.edu/people/pagre/commons.html>>. Retrieved December 31, 2001.
- . 1999b. Information technology and democratic institutions. <<http://gseis.ucla.edu/people/agre/ottawa.html>>. Retrieved February 1, 2000.
- . 2001a. Institutions and the entrepreneurial self. <<http://commons.somewhere.com/rre/2001/RRE.Institutions.and.the.html>>. Retrieved December 20, 2001.
- . 2001b. Networking on the network. <<http://dliis.gseis.ucla.edu/people/pagre/network.html>>. Retrieved October 19, 2001.
- Aichholzer, G., and R. Schmutzer. 2001. *The digital divide in Austria*. Vienna: Institute of Technology Assessment.
- Alkalimat, A., and K. Williams. 2001. Social capital and cyberpower in the African American community: A case study of a community technology centre

in the dual city. In *Community informatics: Shaping computer-mediated social networks*, ed. L. Keeble and B. Loader, 177–204. London: Routledge.

Alvarez, R. M., and J. Nagler. 2001. The likely consequences of Internet voting for political representation. *Loyola of Los Angeles Law Review* 34 (3): 1115–1153.

Amadeu da Silva, S. 2001. *Exclusão Digital: A miséria na era da informação*. São Paulo: Fundação Perseu Abramo.

ASCII. 2001. Jargon File 4.3.1. <<http://www.tuxedo.org/~esr/jargon/html/entry/ASCII.html>>. Retrieved January 2, 2002.

Askonas, P., and A. Stewart, eds. 2000. *Social inclusion: Possibilities and tensions*. Houndmills, England: Macmillan.

Barlow, J. P. 1996. Declaration of independence of cyberspace. <<http://www.eff.org/~barlow/Declaration-Final.html>>. Retrieved July 1, 1999.

Bartholomae, D. 1986. Inventing the university. *Journal of Basic Writing* 5 (1): 4–23.

Bateson, G. 1972. *Steps to an ecology of mind: A revolutionary approach to man's understanding of himself*. New York: Ballantine.

Báthory-Kitz, D. 1999. Web accessibility of the presidential candidate sites. <<http://orbitaccess.com/presidential/>>. Retrieved January 6, 2002.

Becker, H. J. 1993. Computer experience, patterns of computers use, and effectiveness—An inevitable sequence or divergent national cultures? *Studies in Educational Evaluation* 19 (Summer): 127–148.

———. 2000. Who's wired and who's not? *The Future of Children* 10 (2): 44–75.

Bell, D. 1973. *The coming of post-industrial society*. New York: Basic Books.

Binns, D. 2001. Review of de Soto's *The mystery of capital: Why capitalism triumphs in the West and fails everywhere else*. <<http://www.fed.org/onlinemag/jan01/reviews.htm>>. Retrieved February 21, 2002.

Birdsall, N., and O. C. Lesley. 1999. *Globalization, income distribution and education: Putting education to work in Egypt*. Cairo: Egyptian Center for Economic Studies.

Birdsall, N., and J. L. Londoño. 1997. *Inequality and human capital accumulation in Latin America (with some lessons for Egypt)*. Distinguished Lecture Series 7. Cairo: Egyptian Center for Economic Studies.

Blom, J.-P., and J. J. Gumperz. 1972. Social meaning in linguistic structures: Code-switching in Norway. In *Directions in sociolinguistics*, ed. J. J. Gumperz and D. Hymes, 407–434. New York: Holt, Rinehart and Winston.

Bloom, J. R. 1982. Social support, accommodation to stress and adjustment to breast cancer. *Social Science and Medicine* 16: 1329–1338.

Bolter, J. D. 1991. *Writing space: The computer, hypertext, and the history of writing*. Hillsdale, N.J.: Erlbaum.

- . 1996. Ekphrasis, virtual reality, and the future of writing. In *The future of the book*, ed. G. Nunberg, 253–272. Berkeley: University of California Press.
- Bourdieu, P. 1986. The forms of capital. In *Handbook of theory and research for the sociology of education*, ed. J. G. Richardson, 241–258. Westport, Conn.: Greenwood Press.
- Bourguignon, F., and C. Morrison. 1999. *The size distribution of income among world citizens*. Paris: Delta and University of Paris, Département et laboratoire d'économie théorique et appliquée.
- Bowles, S., and H. Gintis. 1976. *Schooling in capitalist America: Educational reform and the contradictions of economic life*. New York: Basic Books.
- Brown, D. C. 1980. *Electricity for rural America: The fight for the REA*. Westport, Conn.: Greenwood Press.
- Brown, J. S., A. Collins, and P. Duguid. 1989. Situated cognition and the culture of learning. *Educational Researcher* 18 (1): 32–42.
- Brown, J. S., and P. Duguid. 2000. *The social life of information*. Boston: Harvard Business School Press.
- Bruner, J. S. 1972. *The relevance of education*, ed. Anita Gil. London: Allen and Unwin.
- Buchner, B. J. 1988. Social control and the diffusion of modern telecommunications technologies: A cross-national study. *American Sociological Review* 53 (3): 446–453.
- Burbules, N. C., and T. A. Callister, Jr. 2000. *Watch IT: The risks and promises of information technologies for education*. Boulder, Colo.: Westview Press.
- Bush, V. 1945. As we may think. *Atlantic Monthly* 176: 101–108.
- Buzato, M. E. K. 2001. O letramento eletrônico e o uso do computador no ensino de língua estrangeira: Contribuições para a formação de professores. Master's thesis, Universidade Estadual de Campinas, Campinas, Brazil.
- Byrne, D. 1999. *Social exclusion*. Buckingham, England: Open University Press.
- Canfield, J., and M. V. Hansen. 1993. *Chicken soup for the soul*. Deerfield Beach, Fla.: Health Communications, Inc. (HCI).
- Carter, T. F. 1925. *The invention of printing in China and its spread westward*. New York: Ronald Press, 1955.
- Carvin, A. 2000. Mind the gap: The digital divide as the civil rights issue of the new millennium. <<http://www.infotoday.com/MMSchools/Jan2000/carvin.htm>>. Retrieved May 10, 2001.
- . 2001. Website language stats. <<http://owa.benton.org/listserv/wa.exe?A2=ind0104andL=digitaldivideandD=1andT=0andO=DandF=landS=andP=11879>>. Retrieved December 28, 2001.
- Castells, M. 1993. The informational economy and the new international division of labor. In *The new global economy in the information age: Reflections on*

- our changing world*, ed. M. Carnoy, M. Castells, S. S. Cohen, and F. H. Cardoso, 15–43. University Park: Pennsylvania State University Press.
- . 1997. *The power of identity*. Malden, Mass.: Blackwell.
- . 2000a. *End of millennium*. 2d ed. Malden, Mass.: Blackwell.
- . 2000b. *The rise of the network society*. 2d ed. Malden, Mass.: Blackwell.
- . 2001. *The Internet galaxy: Reflections on the Internet, business, and society*. New York: Oxford University Press.
- Castells, M., and E. Kiselyova. 1995. *The collapse of Soviet communism: A view from the information society*. Berkeley: University of California Press.
- Cattagni, A., and E. F. Westat. 2001. Internet access in U.S. public schools and classrooms: 1994–2000. National Center for Education Statistics. <<http://nces.ed.gov/pubs2001/2001071.pdf>>. Retrieved February 21, 2002.
- Chambers, R. 1992. Rural appraisal: Rapid, relaxed and participatory. Discussion Paper 311. Brighton, U.K.: University of Sussex, Institute of Development Studies.
- Charbonnier, G. 1973. “Primitive” and “civilized” peoples: A conversation with Claude Lévi-Strauss. In *The future of literacy*, ed. R. Disch. Englewood Cliffs, N.J.: Prentice-Hall.
- Christensen, C. M. 1997. *The innovator’s dilemma: When new technologies cause great firms to fail*. Boston: Harvard Business School Press.
- Christensen, C. M., T. Craig, and S. Hart. 2001. The great disruption. *Foreign Affairs* 90 (2): 80–95.
- Cisler, S. 2000. Subtract the digital divide. <<http://www.mercurycenter.com/svtech/news/indepth/docs/soap011600.htm>>. Retrieved December 28, 2001.
- Cleaver, H. M. 1998. The Zapatista effect: The Internet and the rise of an alternative political fabric. *Journal of International Affairs* 51 (2): 621–640.
- Clines, F. X. 2001. Wariness leads to motivation in Baltimore free-computer experiment. *New York Times*, May 24.
- CNNIC (China Internet Network Information Center). 2000. *Seminannual survey report on the development of China’s Internet 2000/7*. <<http://www.cnnic.net.cn/develst/e-cnnic200007.shtml>>. Retrieved December 20, 2001.
- . 2001. *Seminannual survey report on the development of China’s Internet 2001/7*. <<http://www.cnnic.net.cn/develst/rep200107-e.shtml>>. Retrieved December 20, 2001.
- Coleman, J. S. 1988. Social capital in the creation of human capital. *American Journal of Sociology* 94: S95–S120.
- Colker, D. 2001. Stirring a virtual melting pot. *Los Angeles Times*, February 20, A1.

- Collier, P. 1998. Social capital and poverty. Social Capital Initiative Working Paper 4. Washington, D.C.: World Bank.
- Collins, A., J. S. Brown, and S. E. Newman. 1989. Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In *Knowing, learning, and instruction*, ed. L. B. Resnick, 453–494. Hillsdale, N.J.: Erlbaum.
- Collins, H., and D. Braga. 2001. Interação e interatividade em duas modalidades de ensino de leitura na Internet. Paper presented at the Brazilian Congress of Applied Linguistics, Belo Horizonte, Brazil.
- Corea, S. 2000. Cultivating technological innovation for development. *Electronic Journal on Information Systems in Developing Countries* 2 (2): 1–15. <<http://www.ejisdc.org/>>. Retrieved December 20, 2001.
- Crystal, D. 1997. *English as a global language*. Cambridge: Cambridge University Press.
- Cuban, L. 1986. *Teachers and machines: The classroom use of technology since 1920*. New York: Teachers College Press.
- . 1993. *How teachers taught: Constancy and change in American classrooms, 1890–1980*. 2d ed. New York: Longman.
- . 2001. *Oversold and underused: Computers in classrooms, 1980–2000*. Cambridge, Mass.: Harvard University Press.
- Cummins, J. 1984. *Bilingualism and special education: Issues in assessment and pedagogy*. Clevedon, England: Multilingual Matters.
- Cummins, J., and D. Sayers. 1990. Education 2001: Learning networks and educational reform. *Computers in the Schools* 7 (1/2): 1–29.
- . 1995. *Brave new schools: Challenging cultural illiteracy through global learning networks*. New York: St. Martin's Press.
- Cyberspeech. 1997. *Time* 149 (June 23): 23.
- Danziger, J. N., W. H. Dutton, R. Kling, and K. L. Kramer. 1982. *Computers and politics: High technology in American local government*. New York: Columbia University Press.
- Day, A., and M. Miller. 1990. Gabriel García Márquez on the misfortunes of Latin America, his friendship with Fidel Castro and his terror of the blank page. *Los Angeles Times Magazine*, September 2, 10.
- de Castell, S., and A. Luke. 1986. Models of literacy in North American schools: Social and historical conditions and consequences. In *Literacy, society, and schooling*, ed. S. de Castell, A. Luke, and K. Egan, 87–109. New York: Cambridge University Press.
- de Soto, H. 2000. *The mystery of capital: Why capitalism triumphs in the West and fails everywhere else*. New York: Basic Books.
- De Vaney, A., S. Gance, and Y. Ma, eds. 2000. *Technology and resistance: Digital communications and new coalitions around the world*. New York: Peter Lang.

- Dede, C. 1995. Testimony to the U.S. Congress, House of Representatives, Joint Hearing on Educational Technology in the 21st century. <http://www.virtual.gmu.edu/SS_research/cdpapers/congrpdf.htm>. Retrieved January 4, 2002.
- . 1997. Rethinking how to invest in technology. <http://www.ascd.org/articles/9711el_dede.html>. Retrieved January 4, 2002.
- The default language. 1999. *Economist* (May 15): 67.
- Dell, M., and C. Fredman. 1999. *Direct from Dell: Strategies that revolutionized an industry*. New York: Harper Business.
- Diamond, L. 1994. Rethinking civil society: Toward democratic consolidation. *Journal of Democracy* 5 (3): 5–17.
- DiCarlo, L. 1997. Buying PCs directly means no muss, no fuss. *PC Week*, February 17, 18.
- Dikhanov, Y., and M. P. Ward. 2000. Towards a better understanding of the global distribution of income. Washington, D.C.: World Bank.
- DiMaggio, P. J., and E. Hargittai. 2001. From the “digital divide” to “digital inequality”: Studying Internet use as penetration increases. Working Paper 19. Princeton, N.J.: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University.
- DiMaggio, P. J., E. Hargittai, R. Neuman, and J. Robinson. 2001. Social implications of the Internet. *Annual Review of Sociology* 27: 307–336.
- Dimaggio, P. J., and W. W. Powell. 1991. Introduction. In *The new institutionalism in organizational analysis*, ed. W. W. Powell and P. J. Dimaggio, 1–38. Chicago: University of Chicago Press.
- Dimond, M. 1979. Social support and adaptation to chronic illness: The case of maintenance hemodialysis. *Research in Nursing and Health* 2: 101–108.
- Dividing lines. 2001. *Education Week on the Web* 20 (May 10). <<http://www.edweek.org/sreports/tc01/tc01article.cfm?slug=35divideintro.h20>>. Retrieved February 22, 2002.
- Eisenstein, E. L. 1979. *The printing press as an agent of change: Communications and cultural transformations in early-modern Europe*. Cambridge: Cambridge University Press.
- European Commission. 2001a. e-Inclusion practices. Background Document 1 to the Working Document. <http://europa.eu.int/comm/employment_social/soc-dial/info_soc/esdis/eincl_1practices.pdf>. Retrieved December 10, 2001.
- . 2001b. e-Inclusion: The information society’s potential for social inclusion in Europe. Commission Staff Working Document SEC (2001)1428. <http://europa.eu.int/comm/employment_social/soc-dial/info_soc/esdis/documents.htm>. Retrieved December 10, 2001.
- Fairclough, N. 1989. *Language and power*. London: Longman.

- FCC (Federal Communications Commission). 1999. FCC releases new telephone subscribership report. <http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1999/nrcc9006.html>. Retrieved May 10, 2001.
- Feenberg, A. 1991. *Critical theory of technology*. New York: Oxford University Press.
- . 1999a. No frills in the virtual classroom. *Academe* 85 (5). <<http://www.aaup.org/SO99Feen.htm>>. Retrieved November 20, 1999.
- . 1999b. *Questioning technology*. London: Routledge.
- Feldman, A., C. Konold, and B. Coulter. 2000. *Network science, a decade later: The Internet and classroom learning*. Mahwah, N.J.: Erlbaum.
- Fergany, N. 1998. *Human capital and economic performance in Egypt*. Mimeo. Cairo.
- Fergany, N., I. Farmaz, and C. Wissa. 1996. *Enrollment in primary education and cognitive achievement in Egypt: Change and determinants*. Cairo: Almishkat Centre for Research and Training.
- Fischer, C. S. 1992. *America calling: A social history of the telephone to 1940*. Berkeley: University of California Press.
- Foster, W., and S. Goodman. 2000. The diffusion of the Internet in China. Stanford University Center for International Security and Cooperation. <<http://cisac.stanford.edu/docs/chinainternet.pdf>>. Retrieved May 5, 2001.
- Freire, P. 1970. The adult literacy process as cultural action for freedom. *Harvard Educational Review* 40: 205–212.
- . 1994. *Pedagogy of the oppressed*. 3d ed. New York: Continuum.
- Freire, P., and D. Macedo. 1987. *Reading the word and the world*. Hadley, Mass.: Bergin and Garvey.
- Gee, J. P. 1996. *Social linguistics and literacies*. London: Taylor and Francis.
- Gee, J. P., G. Hull, and C. Lankshear. 1996. *The new work order: Behind the language of new capitalism*. St. Leonards, Australia: Allen and Unwin.
- Ginsparg, P. 2001. Creating a global knowledge network. Paper presented at the Second Joint ICSU Press–UNESCO Conference on Electronic Publishing in Science. <<http://arXiv.org/blurb/pg01unesco.html>>. Retrieved January 4, 2001.
- Gómez, R., P. Hunt, and E. Lamoureux. 1999. Telecentros y desarrollo social. *Chasqui: Revista Latinoamericana de Comunicación* 66: 54–58.
- Goodin, R. E. 1996. Institutions and their designs. In *The theory of institutional design*, ed. R. E. Goodin, 1–53. Cambridge: Cambridge University Press.
- Goody, J., ed. 1968. *Literacy in traditional societies*. Cambridge: Cambridge University Press.
- Goody, J., and I. Watt. 1963. The consequences of literacy. *Comparative Studies in History and Society* 5: 304–345.

- Governo Electronico. 2001. Relatório final—Oficina para inclusão social. <http://www.governoeletronico.gov.br/arquivos/inclusao_digital_relatorio_final.pdf>. Retrieved December 15, 2001.
- Graddol, D. 1997. *The future of English*. London: British Council.
- . 1999. The decline of the native speaker. In *English in a changing world*, ed. D. Graddol and U. H. Meinhof, 57–68. Guildford, U.K.: Biddles.
- Graham, S., J. Cornford, and M. Simon. 1996. The socio-economic benefits of a universal telephone network: A demand-side view of universal service. *Telecommunications Policy* 20: 1.
- Granovetter, M. 1973. Strength of weak ties. *American Journal of Sociology* 8: 1360–1380.
- Green, H., and L. Himmelstein. 1998. A cyber revolt in health care. *Business Week*, October 19, 154.
- Greenfield, P. M. 1972. Oral and written language: The consequences for cognitive development in Africa, the United States, and England. *Language and Speech* 15: 169–178.
- Gumucio Dagron, A. 2001. *Making waves: Stories of participatory communication for social change*. New York: Rockefeller Foundation.
- Gurstein, M. 2000. *Community informatics: Enabling communities with information and communications technologies*. Hershey, Pa.: Idea Group.
- Haeri, N. 1997. The reproduction of symbolic capital: Language, state, and class in Egypt. *Current Anthropology* 38 (1): 795–805.
- Hafner, K., and M. Lyon. 1996. *Where wizards stay up late: The origins of the Internet*. New York: Simon and Schuster.
- Halliday, M. A. K. 1993. Towards a language-based theory of learning. *Linguistics and Education* 5 (2): 93–116.
- Hampton, K. N. 2000. Examining community in the digital neighborhood: Early results from Canada's wired suburb. In *Digital cities: Technologies, experiences, and future perspectives*, ed. T. Ishida and K. Isbister, 194–208. Heidelberg, Germany: Springer-Verlag.
- . 2001a. Living the wired life in the wired suburb: Netville, glocalization and civil society. Ph.D. diss., University of Toronto.
- . 2001b. Broadband neighborhoods—connected communities. In *CHI 2001 extended abstracts*, ed. J. Jacko and A. Sears, 301–302. New York: Association for Computer Machinery.
- Hampton, K. N., and B. Wellman. 1999. Netville on-line and off-line: Observing and surveying a wired suburb. *American Behavioral Scientist* 43 (3): 475–492.
- . 2001. Long distance community in the network society: Contact and support beyond Netville. *American Behavioral Scientist* 45 (3): 477–496.
- Hanson, E. 2001. Globalization, inequality, and the Internet in India. Paper presented at the annual meeting of the International Studies Association, Chicago.

- Hargittai, E. 1999. Weaving the Western Web: Explaining differences in Internet connectivity among OECD countries. *Telecommunications Policy* 23 (10/11): 701–718.
- . 2002a. How wide a Web: Inequalities in access to information in the age of the Internet. Ph.D. diss., Princeton University.
- . in press. Beyond logs and surveys: In-depth measures of people's Web use skills. *Journal of the American Society for Information Science and Technology Perspectives*.
- Harnad, S. 1991. Post-Gutenberg galaxy: The fourth revolution in the means of production and knowledge. *Public-Access Computer Systems Review* 2 (1): 39–53.
- He, K., and J. Wu. 2001. Innovative research to achieve the objectives of eight-year-old Chinese children's abilities to read and write: The experimentation of integrating information technology into language literacy education. Unpublished manuscript, Beijing Normal University, China.
- Heeks, R. 1999. ICTs, poverty and development. Working Paper 5. Institute for Development Policy and Management, University of Manchester. <<http://idpm.man.ac.uk/idpm/diwpf5.htm>>. Retrieved August 20, 2001.
- Heller, M. 1982. Language, ethnicity and politics in Quebec. Ph.D. diss., University of California at Berkeley.
- Henriquez, J., W. Hollway, C. Urwin, C. Venn, and V. Walkerdine. 1984. *Changing the subject*. New York: Methuen.
- Heydenrych, J. 2001. Computer mediated communication and WWW: Delivery modes and implementation variables—the case of the University of South Africa. <<http://www.techknowlogia.org/>>. Retrieved January 2, 2002.
- Hirsch, E. D. 1987. *Cultural literacy: What every American needs to know*. Boston: Houghton Mifflin.
- Hoffman, D. L., and T. P. Novak. 2001. The growing digital divide: Implications for an open research agenda. In *Understanding the digital economy: Data, tools, and research*, ed. E. Brynjolfsson and B. Kahin, 245–260. Cambridge, Mass.: MIT Press.
- Hornberger, N. 1997. Language policy, language education, and language rights: Indigenous, immigrant, and international perspectives. Paper presented at the annual conference of the American Association for Applied Linguistics, Orlando, Florida.
- How many online? 2001. <http://www.nua.com/surveys/how_many_online/>. Retrieved December 15, 2001.
- Hunt, P. 2001. True stories: Telecentres in Latin America and the Caribbean. *Electronic Journal on Information Systems in Developing Countries* 4 (5): 1–17. <<http://www.ejsdc.org/>>. Retrieved February 22, 2002.
- ICTs in rural poverty alleviation. 2001. *Economic and Political Weekly* 36 (March 17).

- India. 2001. SIL International. <<http://www.sil.org/ethnologue/countries/India.html>>. Retrieved Sept. 1, 2001.
- Indian languages. 2001. <http://indiansaga.com/languages/language_home.html>. Retrieved September 1, 2001.
- Information Technology in Egypt*. 1998. Cairo: American Chamber of Commerce in Egypt.
- Jarboe, K. P. 2001. Inclusion in the information age: Reframing the debate. Athena Alliance. <<http://www.athenaalliance.org/inclusion.html>>. Retrieved December 15, 2001.
- Jarrar, S. A., and B. G. Massialas. 1992. Arab Republic of Egypt. In *International handbook of educational reform*, ed. J. Cookson, W. Peter, A. R. Sadovnik, and S. F. Semel, 149–167. Westport, Conn.: Greenwood Press.
- Jennings, T. 2001. ASCII: American standard code for information infiltration. World Power Systems. <<http://www.wps.com/texts/codes/index.html>>. Retrieved January 2, 2002.
- Jhunjhunwala, A. 2000. Unleashing telecom and Internet in India. Paper presented at the Asia/Pacific Research Center, Stanford University. <<http://www.tenet.res.in/Papers/unleash.html>>. Retrieved December 30, 2001.
- Kalathi, S., and T. C. Boas. 2001. The Internet and state control in authoritarian regimes: China, Cuba, and the counterrevolution. *First Monday* 6 (8). <http://www.firstmonday.dk/issues/issue6_8/kalathil/index.html>. Retrieved October 6, 2001.
- Kaplan, N. 1995. E-literacies. *Computer-Mediated Communication Magazine* 2 (3): 3–35. <<http://sunsite.unc.edu/cmc/mag/1995/mar/kaplan.html>>.
- Kelly, K. 1997. New rules for the new economy. *Wired* 5: 140–144, 186–194.
- Klein, H. K. 1999. Tocqueville in cyberspace: Using the Internet for citizen's associations. *Information Society* 25: 213–220.
- Kling, R. 1991. Computerization and Social Transformations. *Science, Technology, and Human Values* 16 (3): 342–367.
- . 1999. What is social informatics and why does it matter? *D-Lib Magazine* 5 (1). <<http://www.dlib.org/dlib/january99/kling/01kling.html>>. Retrieved December 15, 2001.
- . 2000. Learning about information technologies and social change: The contribution of social informatics. *Information Society* 16 (3): 1–36.
- Kling, R., J. Fortuna, and A. King. 2001. The real stakes of virtual publishing: The transformation of E-Biomed into PubMed Central. CSI Working Paper 01–03. Indiana University Center for Social Informatics. <<http://www.slis.indiana.edu/csi/wp/wp01-03B.html>>. Retrieved January 5, 2002.
- Kling, R., and W. Scacchi. 1979. Recurrent dilemmas of computer use in complex organizations. *Proceedings of the National Computer Conference* 48: 107–116.

- . 1982. The web of computing: Computer technology as social organization. In *Advances in Computers*, vol. 21, ed. M. C. Yovits, 3–85. New York: Academic Press.
- Kraemer, K. L., J. Dedrick, and S. Yamashiro. 2000. Refining and extending the business model with information technology: Dell computer corporation. *Information Society* 16 (1): 5–21.
- Kramsch, C., F. A'Ness, and E. Lam. 2000. Authenticity and authorship in the computer-mediated acquisition of L2 literacy. *Language Learning and Technology* 4 (2): 78–104.
- Kranzberg, M. 1985. The information age: Evolution or revolution? In *Information technologies and social transformation*, ed. B. R. Guile, 35–54. Washington, D.C.: National Academy of Engineering.
- Krashen, S. 1989. We acquire vocabulary and spelling by reading: additional evidence for the input hypothesis. *Modern Language Journal* 73: 440–464.
- Kraut, R., S. Kiesler, B. Boneva, J. Cummings, V. Helgeson, and A. Crawford. 2002. Internet paradox revisited. *Journal of Social Issues* 58: 49–74.
- Kraut, R., M. Patterson, V. Lundmark, S. Kiesler, T. Mukophadhyay, and W. Scherlis. 1998. Internet paradox: A social technology that reduces social involvement and psychological well-being. *American Psychologist* 53 (9): 1017–1031.
- Kress, G. 1998. Visual and verbal modes of representation in electronically mediated communication: The potentials of new forms of text. In *Page to screen: Taking literacy into the electronic era*, ed. I. Snyder, 53–79. London: Routledge.
- Kress, G., and T. van Leeuwen. 1996. *Reading images: The grammar of visual design*. London: Routledge.
- Krishna, A. 2000. Creating and harnessing social capital. In *Social capital: A multifaceted perspective*, ed. P. Dasgupta and I. Serageldin, 71–93. Washington, D.C.
- Kualono. 2001. *Leokī: Kikowaena Kelaka'a'ike 'Ōlelo Hawai'i*. <<http://www.olelo.hawaii.edu/eng/information/leoki.html>>. Retrieved January 1, 2002.
- Labaton, S. 2001. New F.C.C. chief would curb agency reach. *New York Times*, February 7.
- Lamberg, L. 1997. Computers enter mainstream psychiatry. *Journal of the American Medical Association* 278: 799–801.
- Languages in Europe. 2002. <<http://europa.eu.int/comm/education/languages/lang/europeanlanguages.html>>. Retrieved January 1, 2002.
- Lanham, R. A. 1993. *The electronic word: Democracy, technology, and the arts*. Chicago: University of Chicago Press.
- Lankshear, C. 1994. *Critical literacy*. Belconnen, Australia: Australian Curriculum Studies Association.

- Lave, J. 1988. *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge: Cambridge University Press.
- Lave, J., and E. Wenger, eds. 1991. *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Lazarus, W., and F. Mora. 2000. *Online content for low-income and underserved Americans: The digital divide's new frontier*. Santa Monica, Calif.: Children's Partnership.
- Lerner, D. 1958. *The passing of traditional society*. New York: Free Press.
- Lessig, L. 1999. *Code and other laws of cyberspace*. New York: Basic Books.
- Levine, P. 2001. The Internet and civil society: Dangers and opportunities. <http://www.cisp.org/imp/may_2001/05_01levine.htm>. Retrieved October 6, 2001.
- Levinson, P. 1997. *The soft edge: A natural history and future of the information revolution*. London: Routledge.
- Lievrouw, L. A. 2000. The information environment and universal service. *Information Society* 16: 155–159.
- Lin, N. 2001. *Social capital: A theory of social structure and action*. Cambridge: Cambridge University Press.
- Littlewood, P., I. Glorieux, S. Herkommer, and I. Jonsson, eds. 1999. *Social exclusion in Europe: Problems and paradigms*. Aldershot, England: Ashgate.
- Loader, B., B. Hague, L. Keeble, and D. Eagle, eds. 2001. *Community informatics: Shaping computer-mediated social networks*. London: Routledge.
- Luria, A. R. 1976. *Cognitive development: Its cultural and social foundations*. Cambridge, Mass.: Harvard University Press.
- Magretta, J. 1998. The power of virtual integration: An interview with Dell Computer's Michael Dell. *Harvard Business Review* (March–April): 73–84.
- McConnell, S. 2000. A champion in our midst: Lessons learned from the impact of NGOs' use of the Internet. *Electronic Journal on Information Systems in Developing Countries* 2 (5): 1–14. <<http://www.ejisdc.org/>>. Retrieved December 20, 2001.
- McLuhan, M. 1962. *The Gutenberg galaxy: The making of typographic man*. Toronto: University of Toronto Press.
- Means, B., ed. 1994. *Technology and education reform: The reality behind the promise*. San Francisco: Jossey-Bass.
- Milanovic, B. 1999. True world income distribution, 1988 and 1993: First calculation based on household surveys alone. Washington, D.C.: World Bank.
- Milloy, C. 1981. D.C. schools: How to make do with less. *Washington Post*, November 15, B1.
- Mitra, S. 1999. Minimally invasive education for mass computer literacy. *CSI Communications* (June): 12–16. Computer Society of India. <<http://www.csi-india.org/csicomm.html>>. Retrieved February 22, 2002.

- Mokyr, J. 1990. *The lever of riches: Technological creativity and economic progress*. New York: Oxford University Press.
- Morton, F. S., F. Zettermeyer, and J. Silva-Risso. 2001. Consumer information and price discrimination: Does the Internet affect the pricing of new cars to women and minorities? Working Paper 8668. National Bureau of Economic Research. <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=294106>. Retrieved January 4, 2002.
- Mukherjee, N. 1993. *Participatory rural appraisal: Methodology and applications*. New Delhi: Concept Publishing.
- Murray, D. E. 1995. *Knowledge machines: Language and information in a technological society*. London: Longman.
- Neumann, P., and C. Uhlenkücken. 2001. Assistive technology and the barrier-free city: A case study from Germany. *Urban Studies*: 38 (2): 367–376.
- Nie, N. H., and L. Erbring. 2000. *Internet and society: A preliminary report*. Stanford: Stanford Institute for the Quantitative Study of Society. <http://www.stanford.edu/group/siqss/Press_Release/Preliminary_Report.pdf>. Retrieved December 20, 2001.
- Nielsen, J. 1999. Disabled accessibility: The pragmatic approach. <<http://www.useit.com/alertbox/990613.html>>. Retrieved January 6, 2002.
- Noble, D. 1998a. Digital diploma mills. Part 1: The automation of higher education. <<http://communication.ucsd.edu/dl/ddm1.html>>. Retrieved May 30, 1999.
- . 1998b. Digital diploma mills. Part 2: The coming battle over online instruction. <<http://communication.ucsd.edu/dl/ddm2.html>>. Retrieved May 30, 1999.
- NTIA (National Telecommunications and Information Administration). 2000. *Falling through the net: Toward digital inclusion*. Washington, D.C.
- Nye, D. 1990. *Electrifying America: A social meaning of new technology, 1880–1940*. Cambridge, Mass.: MIT Press.
- Ochs, E., and B. Shieffelin. 1984. Language acquisition and socialization: Three developmental stories and their implications. In *Culture theory: Essays on mind, self, and emotion*, ed. R. Shweder and R. Levine, 276–320. Cambridge: Cambridge University Press.
- OECD (Organization for Economic Cooperation and Development). 2000. *OECD information technology outlook 2000: ICTs, e-commerce, and the information economy*. <<http://www.oecd.org/>>.
- . 2001. *Communications outlook 2001*. <<http://www.oecd.org/>>.
- O’Leary, S. D. 2000. Falun Gong and the Internet. *Online Journalism Review*, June 15. <<http://ojr.usc.edu/content/story.cfm?request=390>>. Retrieved January 1, 2002.
- Olson, D. R. 1977. From utterance to text: The bias of language in speech and writing. *Harvard Educational Review* 47 (3): 257–281.

- . 1994. *The world on paper*. Cambridge: Cambridge University Press.
- Ong, W. 1982. *Orality and literacy: The technologizing of the word*. London: Routledge.
- Oppenheimer, T. 1997. The computer delusion. *Atlantic Monthly* 289 (July): 48–62.
- Orr, J. 1966. *Talking about machines: An ethnography of a modern job*. Ithaca, N.Y.: IRL Press.
- Osin, L. 1998. Computers in education in developing countries: Why and how? *Education and Technology Technical Notes Series* 13 (1). Washington, D.C.: World Bank.
- Papert, S. 1980. *Mindstorms: Children, computers, and powerful ideas*. New York: Basic Books.
- Pastore, M. 2000. Web pages by language. <http://cyberatlas.internet.com/big_picture/demographics/article/0,1323,5901_408521,00.html>. Retrieved August 20, 2001.
- Patterson, R., and E. J. Wilson. 2000. New IT and social inequality: Resetting the research and policy agenda. *Information Society*: 16 (1): 77–86.
- PCs and teachers omitted from new computer science curriculum. 2000. *Egyptian Gazette*, September 22, 2.
- Perez, C., and L. Soete. 1988. Catching up in technology: Entry barriers and windows of opportunity. In *Technical change and economic theory*, ed. G. Dossi, C. Freeman, R. Nelson, G. Silverberg, and L. Soete, 458–479. London: Pinter.
- Pershing, S. B. 2001. The voting rights act in the Internet age: An equal access theory for interesting times. *Loyola of Los Angeles Law Review* 34 (3): 1171–1211.
- Piaget, J. 1970. *Science of education and the psychology of the child*. New York: Orion Press.
- Pomfret, J. 2000. A low-key revolution: China's gays are coming out of the closet. *International Herald Tribune*, January 25, 2001.
- Population Reference Bureau. 2001. *2001 world population datasheet*. <<http://www.prb.org/>>. Retrieved December 15, 2001.
- Poster, M. 1997. Cyberdemocracy: Internet and the public sphere. In *Internet culture*, ed. D. Porter, 201–217. New York: Routledge.
- Postman, N. 1993. *Technopoly: The surrender of culture to technology*. New York: Vintage Books.
- Potashnik, M. 1996. Chile's learning network. *Education and Technology Technical Notes Series* 1 (2). Washington, D.C.: World Bank.
- Preston, P., and R. Flynn. 2000. Rethinking universal service: Citizenship, consumption norms, and the telephone. *Information Society*: 16: 91–98.

- Prinsloo, M., and M. Breir, eds. 1996. *The social uses of literacy: Theory and practice in contemporary South Africa*. Philadelphia: Sached Books.
- Proenza, F., J. Bastidas-Buch, and G. Montero. 2001. Telecenters for socio-economic and rural development in Latin America and the Caribbean. Inter-American Development Bank. <<http://www.iadb.org/regions/itdev/telecenters>>. Retrieved October 16, 2001.
- Putnam, R. 1993. The prosperous community: Social capital and public life. *American Prospect* 13: 35–42.
- . 2000. *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.
- Rajora, R. 2002. *Bridging the digital divide: Gyanoot, the model for community networks*. New Delhi: Tata–McGraw Hill.
- Redden, G. 2001. Networking dissent: The Internet and the anti-globalization movement. *Mots Pluriels* 18. <<http://www.arts.uwa.edu.au/MotsPluriels/MP1801gr.html>>. Retrieved October 6, 2001.
- Reich, R. 1991. *The work of nations: Preparing ourselves for 21st century capitalism*. New York: Knopf.
- Renfrew, C. 1984. *Electricity, industry, and class in South Africa*. Albany: State University of New York Press.
- Resnick, P. 2002. Beyond bowling together: Sociotechnical capital. In *Human computer interaction in the new millennium*, ed. J. Carroll, 247–272. New York: Addison-Wesley.
- Rheingold, H. 2000. *The virtual community: Homesteading on the electronic frontier*. 2d ed. Cambridge, Mass.: MIT Press.
- Robison, K. K., and E. M. Crenshaw. 2000. Cyber-space and postindustrial transformations: A cross-national analysis of Internet development. Paper presented at the annual meeting of the American Sociological Association, Washington, D.C. <<http://home.columbus.rr.com/krisrobison/robisoncrensaw/cyber1ssrr.pdf>>. Retrieved December 31, 2001.
- Rodan, G. 1998. The Internet and political control in Singapore. *Political Science Quarterly* 113 (Spring).
- Rogers, E. M. 1962. *Diffusion of innovations*. New York: Free Press.
- Ronfeldt, D., and J. Arquilla. 2001. Networks, netwars, and the fight for the future. *First Monday* 6 (10). <http://www.firstmonday.org/issues/issue6_10/ronfeldt/>. Retrieved January 5, 2001.
- Ronfeldt, D., J. Arquilla, G. E. Fuller, and M. Fuller. 1998. *The Zapatista social netwar in Mexico*. Santa Monica, Calif.: RAND Corp.
- Rosenthal, E. 2001. China jails six for spreading sect's material. *New York Times*, December 24, A9.
- Salamon, L. M. 1994. The rise of the nonprofit sector. *Foreign Affairs* 73 (4): 109–122.

- Sandholtz, J. H., C. Ringstaff, and D. C. Dwyer. 1997. *Teaching with technology: Creating student-centered classrooms*. New York: Teachers College Press.
- Sarhaddi Nelson, S. 2001. Egyptians' obsession with grades fails to nurture creative thinkers. *Los Angeles Times*, January 21, A8.
- Schank, R. C., and C. Cleary. 1995. *Engines for education*. Hillsdale, N.J.: Erlbaum.
- Schaub, M. 2000. English in the Arab Republic of Egypt. *World Englishes* 19 (2): 225–238.
- Schecter, S., D. Sharken-Taboada, and R. Bayley. 1996. Bilingual by choice: Latino parents' rationales and strategies for raising children with two languages. *Bilingual Research Journal* 20 (2): 261–281.
- Schement, J. R., and S. C. Forbes. 2000. Identifying temporary and permanent gaps in universal service. *Information Society* 16 (2): 117–126.
- Schofield, J. W., and A. L. Davidson. in press. Achieving equality of student Internet access within schools. In *The social psychology of group identity and social conflict*, ed. A. H. Eagly, R. M. Baron, and V. L. Hamilton. Washington, D.C.: APA Books.
- Scribner, S., and M. Cole. 1981. *The psychology of literacy*. Cambridge, Mass.: Harvard University Press.
- SDRTA (San Diego Regional Technology Alliance). 2001. Mapping a future for digital connections: A study of the digital divide in San Diego County. <http://www.sdrta.org/sdrta/aboutsdrta/RTA_Report_0201.pdf>. Retrieved September 7, 2001.
- Seiter, E. 1993. *Sold separately: children and parents in consumer culture*. New Brunswick, N.J.: Rutgers University Press.
- . 2000. *Television and new media audiences*. Oxford: Oxford University Press.
- Selfe, C. 1990. Technology in the English classroom: Computers through the lens of feminist theory. In *Computers and community: Teaching composition in the twenty-first century*, ed. C. Handa, 118–139. Portsmouth, N.H.: Heinemann.
- Selfe, C., and R. J. Selfe. 1994. The politics of the interface: Power and its exercise in electronic contact zones. *College Composition and Communication* 45 (4): 480–504.
- Serageldin, I., and C. Grootaert. 2000. Defining social capital: An integrated view. In *Social capital: A multifaceted perspective*, ed. P. Dasgupta and I. Serageldin, 40–58. Washington, D.C.: World Bank.
- Shetzer, H., and M. Warschauer. 2000. An electronic literacy approach to network-based language teaching. In *Network-based language teaching: Concepts and practice*, ed. M. Warschauer and R. Kern, 171–185. New York: Cambridge University Press.

- Singer, C., E. J. Holmyard, A. R. Hall, and T. I. Williams. 1958. *A history of technology: The industrial revolution, c. 1750 to c. 1850*. Vol. 4. Oxford: Clarendon Press.
- Singh, J. P. 1999. *Leapfrogging development? The political economy of telecommunications restructuring*. Albany: State University of New York Press.
- Smith, J. 2001. The mystery of capital. Review. *Geonomist* 9 (3). <<http://www.progress.org/geonomy/geonom93.htm>>. Retrieved October 2, 2001.
- Smith, P. J., and E. Smythe. 1999. Globalization, citizenship and technology: The MAI meets the Internet. *Canadian Foreign Policy* 7 (2): 83–105.
- Spyd3r. 1998. The history of hacking. Help Net Security. <<http://www.net-security.org/text/articles/history.shtml>>. Retrieved February 23, 2002.
- Stanley, L. 2001. *Beyond access*. Occasional Paper 2. San Diego, Calif.: UCSD Civic Collaborative.
- Stewart, A. 2000. Social inclusion: An introduction. In *Social inclusion: Possibilities and tensions*, ed. P. Askonas and A. Stewart, 1–16. Houndmills, England: Macmillan.
- Street, B. 1984. *Literacy in theory and practice*. Cambridge: Cambridge University Press.
- . 1993. Introduction: The new literacy studies. In *Cross-cultural approaches to literacy*, ed. B. V. Street, 1–21. Cambridge: Cambridge University Press.
- . 1995. *Social literacies: Critical approaches to literacy in development, ethnography and education*. London: Longman.
- Sunstein, C. 2001. *Republic.com*. Princeton, N.J.: Princeton University Press.
- Tannen, D. 1994. *Gender and discourse*. New York: Oxford University Press.
- Tauscher, L., and S. Greenberg. 1997. How people revisit Web pages: Empirical findings and implications for the design of history systems. *International Journal of Human Computer Studies* 47 (1): 97–138.
- Tawila, S., C. B. Lloyd, B. S. Bensch, and H. Wassef. 2000. *The school environment in Egypt: A situational analysis of public preparatory schools*. Cairo: Population Council.
- Theil, H. 1967. *Economics and information theory*. Chicago: Rand McNally.
- Thierer, A. D. 2001. How free computers are filling the “digital divide”: A PowerPoint presentation. Heritage Foundation. <<http://www.heritage.org/features/powerpoint/digitaldivide/>>. Retrieved February 23, 2002.
- Tocqueville, A. de. 1835. *Democracy in America*. 2 vols. New York: Vintage Books, 1937, 1945.

- Todd, L., and I. Hancock. 1987. *International English Usage*. New York: NYU Press.
- Tukey, J. W. 1962. The future of data analysis. *Annals of Mathematical Statistics* 33: 13–14.
- Tuman, M. 1992. *Word perfect: Literacy in the computer age*. Pittsburgh: University of Pittsburgh Press.
- Turner, J. H. 2000. The formation of social capital. In *Social capital: A multi-faceted perspective*, ed. P. Dasgupta and I. Serageldin, 94–146. Washington, D.C.: World Bank.
- Turner, J. W., J. A. Grube, and J. Meyers. 2001. Developing an optimal match within online communities: An exploration of CMC support communities and traditional support. *Journal of Communication* 51 (2): 231–251.
- UNDP (United Nations Development Programme). 1999a. *China human development report: Transition and the state*. Oxford University Press (China). <<http://www.unchina.org/undp/press/html/cnhdr99.htm>>. Retrieved February 23, 2002.
- . 1999b. *Human development report 1999: Globalization with a human face*. <<http://www.un.org/Pubs/textbook/e99hdp.htm>>. Retrieved February 23, 2002.
- . 2000. *Human development report 2000: Human rights and human development*. <<http://www.undp.org/hdr2000/home.html>>. Retrieved February 23, 2002.
- . 2001. *Human development report 2001: Making new technologies work for human development*. <<http://www.undp.org/hdro/>>. Retrieved February 23, 2002.
- United States Census Bureau. 1995. *Statistical abstract of the United States*. Washington, D.C.
- Verdisco, A., and J. C. Navarro. 2000. Costa Rica: Teacher training for education technology. <<http://www.techknowlogia.org/>>. Retrieved December 31, 2001.
- Vygotsky, L. S. 1978. *Mind in society*, ed. M. Cole, V. John-Steiner, S. Scribner, and E. Souberman. Cambridge, Mass.: Harvard University Press.
- . 1981. The genesis of higher mental functions. In *The concept of activity in Soviet psychology*, ed. J. V. Wertsch, 144–188. Armonk, N.Y.: M. E. Sharpe.
- Wade, R. 2001. Winners and losers. *Economist*, April 28, 79–82.
- Wales, J. A. 2001a. Equity and access to higher education for underrepresented students: Can advanced placement opportunities through online learning make a difference? The implications for technology. Unpublished manuscript, University of California at Irvine.

- . 2001b. Online AP macroeconomics. Unpublished manuscript, University of California at Irvine.
- . 2001c. Online introduction to computer science and the C programming language. Unpublished manuscript, University of California at Irvine.
- Wallsten, S. J. 2001. An econometric analysis of telecom competition, privatization, and regulation in Africa and Latin America. *Journal of Industrial Economics* 49 (1): 1–20.
- Walton, A. 1999. Technology vs. African-Americans. *Atlantic Monthly* 283 (1): 14–18.
- Warschauer, M. 1997. Computer-mediated collaborative learning: Theory and practice. *Modern Language Journal* 81 (3): 470–481.
- . 1998. Technology and indigenous language revitalization: Analyzing the experience of Hawai'i. *Canadian Modern Language Review* 55 (1): 140–161.
- . 1999. *Electronic literacies: Language, culture, and power in online education*. Mahwah, N.J.: Erlbaum.
- . 2000a. The changing global economy and the future of English teaching. *TESOL Quarterly* 34: 511–535.
- . 2000b. Technology and school reform: A view from both sides of the tracks. *Education Policy Analysis Archives* 8 (4). <<http://epaa.asu.edu/epaa/v8n4.html>>. Retrieved January 2, 2002.
- . 2001a. The allures and illusions of modernity: Technology and educational reform in Egypt. Unpublished manuscript.
- . 2001b. Language choice online: Globalization vs. identity in the age of information. Unpublished manuscript.
- . 2001c. Singapore's dilemma: Control vs. autonomy in IT-led development. *Information Society* 17 (4): 305–311.
- Warschauer, M., and K. Donaghy. 1997. Leokī: A powerful voice of Hawaiian language revitalization. *Computer Assisted Language Learning* 10 (4): 349–362.
- Warschauer, M., G. Refaat, and A. Zohry. 2000. Language and literacy online: A study of Egyptian Internet users. Paper presented at the annual meeting of the American Association for Applied Linguistics, Vancouver, Canada.
- Web surpasses one billion documents. 2000. <<http://www.inktomi.com/news/press/2000/billion.html>>. Retrieved August 1, 2001.
- Weedon, C. 1987. *Feminist practice and poststructuralist theory*. London: Blackwell.
- Wellman, B., A. Q. Haase, J. Witte, and K. Hampton. 2001. Does the Internet increase, decrease, or supplement social capital?: Social networks, participation, and community commitment. *American Behavioral Scientist* 45 (3): 437–456.
- Wells, G., and G. L. Chang-Wells. 1992. *Constructing knowledge together*. Portsmouth, N.H.: Heinemann.

Wenglinsky, H. 1998. Does it compute? The relationship between educational technology and student achievement in mathematics. Policy Information Report. Educational Testing Service. <<ftp://ftp.ets.org/pub/res/technolog.pdf>>. Retrieved January 5, 2002.

West, C. 1990. Not just “doctor’s orders”: Directive-response sequences in patients’ visits to women and men physicians. *Discourse and Society* 1 (1): 85–113.

Whalen, J., and E. Vinkhuyzen. 2000. Expert systems in (inter)action: Diagnosing document machine problems over the telephone. In *Workplace studies: Recovering work practice and informing system design*, ed. P. Luff, J. Hindmarsh, and H. Christiapp, 92–140. New York: Cambridge University Press.

Willis, P. E. 1977. *Learning to labor: How working class kids get working class jobs*. New York: Columbia University Press.

Wilson, E. 2000. *Briefing the President*. Internet Policy Institute. <<http://www.internetpolicy.org/briefing/ErnestWilson0700.html>>. Retrieved May 10, 2001.

Wilson, W. H. 1998. I ka ’olelo Hawai’i ke ola [Life is found in the Hawaiian language]. *International Journal of the Sociology of Language* 132: 123–137.

Winner, L. 1986. *The whale and the reactor: The search for limits in a technological society*. Chicago: University of Chicago Press.

Woolcock, M. 1998. Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society* 27: 151–208.

World development report 1998/99: Knowledge and development. Washington, D.C.: World Bank.

World development report 2000/01: Attacking poverty. Washington, D.C.: World Bank.

World Wide Web Consortium. 2001a. Checklist of checkpoints for Web content accessibility guidelines 1.0. <<http://www.w3.org/tr/wai-webcontent/full-checklist.html>>. Retrieved January 6, 2002.

———. 2001b. How people with disabilities use the Web. <<http://www.w3.org/wai/eo/drafts/pwd-use-web/overview.html>>. Retrieved January 6, 2002.

———. 2001c. User agent accessibility guidelines 1.0. <<http://www.w3.org/tr/uag10/>>. Retrieved January 6, 2002.

Wysocki, B. 1999. Dell or be delled. *Wall Street Journal*, May 10, A1.

Yeo, S., and A. Mahizhnan. 1999. Censorship: Rules of the game are changing. *Sunday Times*, August 15, 34–35.

Young, J. R. 2001. Does “digital divide” rhetoric do more harm than good? *Chronicle of Higher Education*, November 9. <<http://chronicle.com/free/v48/i11/11a05101.htm>>. Retrieved December 10, 2001.

Zanini, M., and S. J. A. Edwards. 2001. The networking of terror in the information age. In *Networks and netwars: The future of terror, crime, and militancy*, ed. J. Arquilla and D. Ronfeldt, 29–58. Santa Monica, Calif.: RAND Corp.

- Zook, M. A. 2001a. Domain names worldwide. <<http://www.zooknic.com/Domains/international.html>>. Retrieved December 28, 2001.
- . 2001b. Domains per capita. <http://www.zooknic.com/Domains/Domains_per_capita.pdf>. Retrieved December 28, 2001.
- . 2001c. Old hierarchies or new networks of centrality? The global geography of the Internet content market. *American Behavioral Scientist* 44 (10): 1679–1696.
- Zuboff, S. 1988. *In the age of the smart machine: The future of work and power*. New York: Basic Books.

